

TMIP Connection

The Travel Model Improvement Program Newsletter



Developing Land Use and Transportation Models at the Sacramento Area Council of Governments

Gordon R. Garry, *Manager of Research and Analysis, SACOG*

The Sacramento Area Council of Governments (SACOG) is working to improve analysis capabilities in order to meet Metropolitan Planning Organization (MPO) responsibilities and local needs to integrate land use, economic, transportation, and air quality policies. The approach is to take some of the best travel analysis work from around the country and adapt it to SACOG's needs and budget.

Currently SACOG uses a state-of-the-practice travel demand model and a policy-based allocation method to project population, housing, and employment growth. While this process has provided useful information, it is also clear that there is room for improvement. In 2000-2001 SACOG conducted a model design project to fully integrate the land use, economic, and travel forecasting requirements. SACOG identified needed improvements (both internally and throughout the region), developed the list of data that will be required, designed a model framework, and estimated the cost of moving to the next generation of forecasting and analysis tools. (That report is available at www.sacog.org) Much of this work was based on model development done at Portland METRO and the Oregon DOT.

Short-term (2 year) and long-term (4-5 years) staged strategies were developed that will bring significant improvements into use, while still working towards meeting additional identified needs.

A New Model Design

The long-term travel model will have two components. Household-based travel demand will be estimated through a tour-based transportation model with microsimulation of households. A synthesis of businesses and firms will be used to forecast goods and services movement (i.e. trucks and commercial vehicles).

Regional growth analysis will be based on an aggregate, spatial input-output (I/O) model, which will allocate economic activity to locations in the region. A land development model will be used for determining location and extent of land use changes through the forecasting process. Taken together, the spatial I/O model and the land development model will be referred to as the land use model.

The integration of the land use and travel models will be accomplished by using accessibility and level of service (LOS) data from the travel model as inputs to the land use model. The land use model, in turn, will generate the household and employment data that will

be used in the travel model. In application, the forecasting process is "path dependent." That is, it steps through time in "slices" of two to five years, with the results of the current time slice providing the basis for the next time slice. This is in contrast to "end state" forecasts, which forecast a horizon year only, but ignore the incremental transitions that take place in getting to the horizon year.

In the Near Term

Funding is not currently available for data collection and model development, but efforts to find the funds are continuing. In the meantime SACOG has started a regional transportation land use study to examine long-range (40-50 year) implications of current land use and transportation decision-making. To

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U.S. Department of Transportation
Federal Highway Administration

Meet the TMIP Review Panel



Neil J. Pedersen

*Deputy Administrator/Chief Engineer
Planning and Engineering
Maryland State Highway Administration*

Neil, chair of the TMIP Review Panel, oversees the offices of Planning

and Preliminary Engineering, Environmental Design, Bridge Development, Highway Development, and Real Estate within the Maryland State Highway Administration. He has been in his current position since August 2000. Prior to that, he was Director of the Office of Planning and Preliminary Engineering.

A native of Massachusetts, Neil has Bachelor's degree from Bucknell University, a Master's degree in Civil Engineering from Northwestern University, and is a registered professional engineer. ■



Ysela Llort

*State Transportation Planner
Florida Department of
Transportation (FDOT)*

As chief planner, Ms. Llort oversees the statewide and systems planning, as well as environmental management functions, for the Florida Department of Transportation (FDOT). Primary responsibilities include executive level policy formulation and interpretation, as well as working with the numerous transportation partners, including metropolitan planning organizations, to obtain consensus on needs and priorities for this unique state. Ms. Llort has been with FDOT since August of 1994.

Ms. Llort is a national leader in transportation planning. She represents the United States in the World Road Association. She was recently named associate member of the National Academy of Sciences for her outstanding contributions and currently represents the State of Florida on numerous national transportation committees.

Prior to her work with FDOT, Ms. Llort served 9 years with the Virginia DOT as Assistant District Engineer for Planning and Operations in the Northern Virginia portion of the Washington, D.C. metropolitan area.

Ms. Llort earned her Bachelor's degree from Duke University and Master's degree from Clemson University. ■



Hot Topics: HOV Assignments

A question recently posed to the list was: What successes have other modelers had with HOV traffic volume results using Multi-Class User Equilibrium assignment methodologies?

The problem encountered was that following a standard modeling process, incorporating special factors for HOV non-eligible and HOV eligible trip tables, resulted in HOV lane volumes higher than actual counts. The assumption was that the volumes are too high (compared to counts) due to the following:

- 1) HOV entry and exit points are difficult to access, enough to defeat travel time savings; and/or
- 2) Some HOV eligible trips will be made in mixed flow lanes despite eligibility.

This question led to a spirited debate on HOV volumes, peak period calibrations, time of day, lane-use, and whether or not to integrate an HOV nest into mode choice models-not to mention the iterative nature of the modeling process!

Because the models find the HOV lanes more attractive than operators do, several suggestions were made to achieve acceptable HOV volumes, including iterations, implementing dampening effects, and accounting for the offsetting nature of HOV lane violators.

To learn more about this discussion and other hot topics in planning analysis, please visit <http://listserv.tamu.edu/archives/tmip-l.html> and subscribe to the TMIP List. ■

Weinberger Joins TMIP Team



Penelope Weinberger
*Associate Research
Specialist
Texas Transportation
Institute (TTI)*

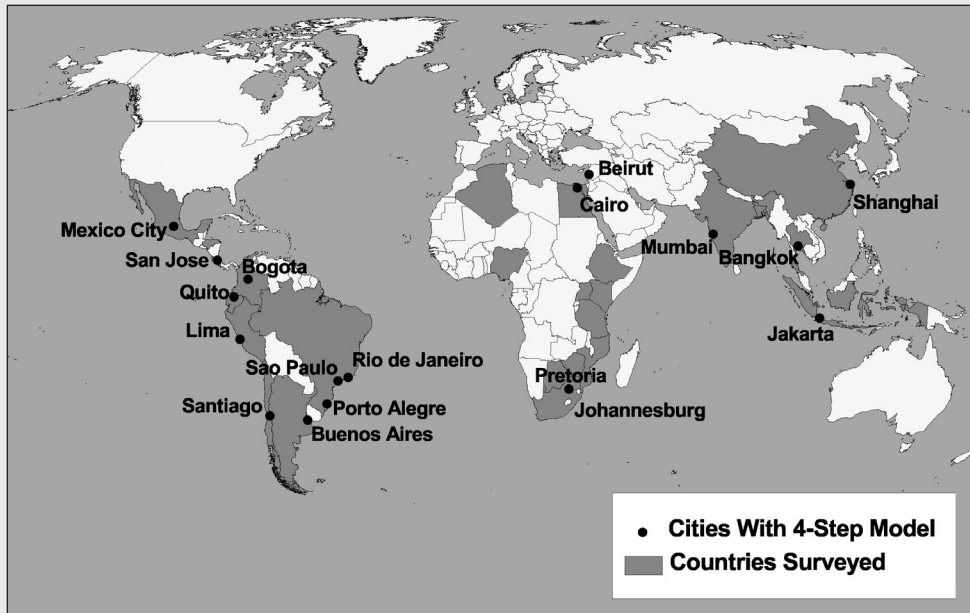
Penelope Weinberger has joined the TMIP

team as an associate research specialist with the Texas Transportation Institute (TTI). Ms. Weinberger will be TTI's on-site staff person at USDOT headquarters in Washington, D.C. Formerly with Cambridge Systematics, Ms. Weinberger will handle much of the TMIP activities related to product development and marketing, review panel coordination, seminars, presentations, and workshops.

Ms. Weinberger has a B.A. in political science from the University of Illinois at Chicago. While at Cambridge Systematics she worked with clients ranging from local and county governments and regional

organizations to state and federal agencies. Her projects included modeling the national highway needs for recommendations of the transportation act, helping to develop the statewide *Texas Transportation Plan* update, and developing a long range needs assessment for the New York State Association of Metropolitan Planning Organizations. She also gathered baseline data for the freight transportation analysis of Georgia High Priority Corridor Six and developed language for the Intelligent Transportation Systems Deployment Analysis Software user's and programmer's manuals. She has also done outreach, GIS, and technical editing among other tasks.

Ms. Weinberger's former experience has been as varied as her clients, and she is looking very forward to bringing her "can do" philosophy to the TMIP team. ■



Source: Cambridge Systematics, Inc.

TRB Panel Addresses Travel Forecasting in Developing Countries

Christopher Porter, *Associate, Cambridge Systematics, Inc.*

A lively panel discussion at this year's annual Transportation Research Board (TRB) Meeting addressed the topic of travel demand forecasting in developing countries. The panel, moderated by Christopher Zegras of MIT, included Kay Axhausen of ETH Zurich; Manfred Breithaupt of GTZ in Germany; Eric Ho of the Gallop Corporation; Francisco Martinez of the University of Chile; Eric Miller of the University of Toronto, Canada; and George Tharakan of the World Bank.

Panelists engaged in a powerful discussion of the best ways to address the lack of existing travel forecasting capability in many cities of the developing world, as well as the need for improved methods to address the severe air quality and congestion problems experienced in these cities. Panelists discussed whether a focused international initiative on the subject might be feasible and effective. They also discussed whether it would be possible to develop a simplified forecasting approach that was less resource and data-intensive than the traditional "four-step," network-based approach commonly applied in developed countries, particularly for parts of the world where many cities lack even basic travel forecasting methods, or even the necessary data to support travel forecasting. Finally, they addressed the questions of whether such a model could adequately address key policy issues facing developing cities, and what institutional barriers exist to adopting such a model in practice.

The U.S. Environmental Protection Agency (EPA) organized the panel discussion, as part of a research project to explore opportunities for improving travel demand forecasting methods to support integrated air quality assessments in developing countries. EPA's Roger Gorham notes that the fact that five TRB committees co-sponsored the panel discussion demonstrates broad interest in the topic. "The results of the panel discussion confirm our research findings that there is a clear need for improved travel and air quality forecasting capabilities, and especially for a simplified approach. There are significant institutional and technical barriers to developing and implementing these improvements, but these barriers do not appear insurmountable."

EPA has undertaken its research with the support of contractors Industrial Economics, Inc. and Cambridge Systematics, Inc. In addition to the panel discussion, the project has included a review of existing data and forecasting methodologies in developing countries, identification of potential modeling approaches, and an assessment of the usefulness of existing, aggregate-level metropolitan area data as a basis for modeling. The final report is expected to be released in April 2003. ■

For more information, contact Roger Gorham, Gorham.Roger@epa.gov

meet the goals of this study SACOG has developed an interim set of connected, rather than integrated, models.

A series of intermediate, evolutionary, and lower cost projects is underway. One such project involved adding more land use sensitivities to the current travel model. Fehr & Peers Associates is adapting the SACOG model with some improvements to vehicle trip and vehicle miles traveled output that incorporate the effects of land density, design, diversity, and destination (i.e., accessibility).

Bob Johnston and Caroline Rodier of the University of California-Davis have been using a MEPLAN-based model of the Sacramento region to examine transportation-land use interactions. Along with Johnston and Rodier, we worked with John Abraham of the University of Calgary to upgrade the model with a developer model, improved development cost and rent data, and incorporated data from a parcel-based land use inventory. The MEPLAN model is used in a trend forecast scenario to allocate growth to the district level, accounting for current development policies, development costs and rents, and accessibility changes.

PLACE³S (PLAnning for Community Energy, Economic and Environmental Sustainability) interactive parcel-level GIS software is being used at SACOG to allocate MEPLAN district-level results to parcels. PLACE³S is used for impact assessment. These parcel-level data are then aggregated back to traffic analysis zones to feed into the travel demand model. The second phase of the transportation land use study also uses PLACE³S in a series of community workshops throughout the region to help citizens create and evaluate alternatives to current growth patterns. Regional alternatives will be developed from information collected at the workshops.

These short range modeling and analysis improvements enable SACOG to move into a new era of integrated transportation-land use planning within time and budget constraints. SACOG has taken its current models and selectively added to them to move forward. The data that is collected and the experience of working with these tools will also be beneficial in the longer term integrated model development. Addressing economic and land use issues, in particular, is a great learning experience that will help in the transition from aggregate analyses to microsimulation land use models. ■

For more information, contact Gordon Garry at (916) 733-3230.

Upcoming Events

Courses

Introduction to Urban Travel Demand Forecasting

March 31–April 4, 2003

Atlanta, GA

Contact: Michael Roberts

FHWA Southern Resource Center

(404) 562-3928

Michael.Roberts@fhwa.dot.gov

Cost: \$530

April 28–May 2, 2003

Carson City, NV

Contact: Penny Silver

Nevada DOT

(775) 888-7807

psilver@dot.state.nv.us

June 16–20, 2003

Costa Mesa, CA

Contact: Institute for Transportation Studies - UC Berkeley

<http://www.its.berkeley.edu/techtransfer/training/>

Cost: \$540 for CA public agencies

Advanced Urban Travel Demand Forecasting

May 12–15, 2003

Denver, CO

Contact: Joel Phillips

Colorado DOT

(303) 757-9524

Joel.Phillips@dot.state.co.us

Multimodal Travel Forecasting

April 1–3, 2003

New Brunswick, NJ

Contact: National Transit Institute

(732) 932-1700

contactus@nti.rutgers.edu

Cost: Contact NTI for fee info

Conferences

9th Application of Transportation

Planning Methods Conference

April 6–11, 2003

Baton Rouge, Louisiana

(225) 767-9167

sromero@dotd.state.la.us

www.ltrc.lsu.edu/TRBConference/

Statewide Transportation Planning Conference

May 18, 2003–May 21, 2003

Florida Keys, FL

Contact: Kim Fisher

E-mail: kfisher@nas.edu

Additional offerings may become available; consult the TMIP website <http://tmip.fhwa.dot.gov/> for the latest training information.

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